

C. Remarks

The claims are 19-21 and 23, with claim 19 being the sole independent claim. Claim 19 has been amended to clarify the invention. Support for this amendment may be found, inter alia, in the specification at page 6, line 14 - page 7, line 8. No new matter has been added. Reconsideration of the present claims and passage to issue of the subject application are expressly requested.

Claims 17-19, 22 and 23 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over U.S. Patent No. 5,952,084 (Anderson) in view of U.S. Patent No. 5,958,809 (Fujiwara). Claims 20 and 21 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Anderson in view of U.S. Patent No. 6,224,976 (Takushima) and U.S. Patent No. 5,028,967 (Yamada). The grounds of rejection are respectfully traversed.

Prior to addressing the merits of rejection, Applicant would like to briefly review some of the key features and advantages of the presently claimed invention. The present invention is directed, in part, to an optical element with a film on its surface, which film comprises at least one layer of silica doped with fluorine ($\text{SiO}_2\text{:F}$). When silica is doped with fluorine, fluorine replaces the oxygen in the structure of silica. Thus, silica doped with fluorine contains a combination silicon, oxygen and fluorine.

Generally, silica does not transmit F_2 laser light with a wavelength of 157 nm. However, when silica is doped with fluorine, transmission of such light becomes possible, as in the presently claimed optical element. Furthermore, since a refractive index of the doped layer is set to be from 1.6 to 1.8, this layer can be used as a high index layer of an optical multilayer film.

Anderson is understood to be directed to a glass substrate coated with one or more films. One of these films is an A film, which is deposited in a reactive atmosphere. While the A film can contain both silicon and fluorine, the A film is clearly not a film of silica doped with fluorine. The A film in Anderson is different in kind from the presently claimed silica doped with fluorine.

Anderson's A film is based on the $Al_xO_yF_z$ ($3x=2y+z$) structure. Anderson teaches introducing silica into this A film, as shown in column 3, lines 28-32. In the resulting film, SiO_2 is intermingled with $Al_xO_yF_z$ as different compounds, as disclosed by Anderson at column 3, lines 47-49. Thus, in Anderson's A film, a fluorine atom is contained in the aluminum oxyfluoride structure, and it does not dope silica.

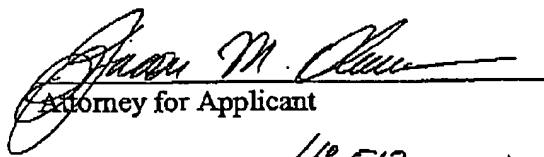
Clearly, Anderson does not disclose or suggest a layer of silica doped with fluorine as presently claimed. Furthermore, since Anderson does not teach doping silica, which cannot transmit F_2 laser light with a wavelength of 157 nm, at most teaching intermingling silica with aluminum oxyfluoride, it is Applicant's understanding that a silica/aluminum oxyfluoride layer in Anderson is incapable of transmitting F_2 laser light with a wavelength of 157 nm.

Fujiwara, Yamada and Takushima cannot provide the teachings missing in Anderson. Like Anderson, none of these references discloses or suggests a layer of silica doped with fluorine formed on an optical element. In fact, Takushima is not understood to disclose or suggest silica doped with fluorine. While Fujiwara and Yamada disclose a silica/fluorine glass (i.e., substrate), these references do not disclose or suggest using silica doped with fluorine as a layer in a film formed on an optical element, as presently claimed.

In conclusion, it is respectfully submitted that the cited references, whether considered separately or in any combination, do not disclose or suggest the combination of elements presently claimed. Wherefore, Applicant respectfully requests that the outstanding rejections be withdrawn and the subject application be passed to issue.

Applicant's undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address given below.

Respectfully submitted,


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